I have now had a chance to review Volumes 1 and 2 of the NAB's comments in this matter and feel compelled to respond.

I found Attachment A to Volume 1 particularly amusing. This report attempts to show that there are still a lot of "independent" stations by counting the number of stations in a particular market that each owner in that market has. This is a totally meaningless measure, as it does not take into account that someone who owns one station in, say, New York, may in fact own one station in each of the top 10 markets. I would like to use a restaurant analogy here. Suppose my town has one McDonalds, one Burger King, one Taco Bell, one Wendy's, one Subway, and one Pizza Hut restaurant. By the logic in NAB's Attachment A, my town has a diverse offering of "independent" restaurants because, except for Taco Bell and Pizza Hut which are both owned by Tricon, all the restaurants in my town have single ownership. By the NAB's reckoning, the country's eating-out needs would be adequately served by this set of restaurants because they provide diversity of "formats" and economic efficiency of multiple cross-market ownership. There is no need for a restaurant such as Buck's of Woodside, the Tree Room at Sundance, or even Gordon's House of Fine Eats in San Francisco (considered one of S.F.'s top restaurants). No, these small operations cannot operate economically and cannot produce quality product.

I could spend more bandwidth on the absurdities of NAB's arguments, but I'd rather move on to technical matters...

I believe Signal-to-Noise is the wrong measure for determining potential interference. The reason for this is that much listening already occurs in low signal-to-noise environments. The signal-to-noise "standards" proposed by the NAB are bogus because they assume a critical listener in a controlled listening environment. According to [Moulton]:

> "...the chief engineer has a mandate from the boss to jazz up the transmitter sound, both to get the level as hot as possible within the power limits imposed by the FCC and to make the station's signal sound as attractive as possible for listeners in cars, who are the primary consumers of radio...
>
> The noise floor in a car is around 70 dBA SPL, and the maximum playback level is a little over 90 dBA SPL...
>
> The actual dynamic signal range we need for CDs in both cars and other venues is about 20 dB for acoustical music and 12 dB for pop/rock. Further, we can hear music 10 dB below the noise floor and will put up with that without complaint...for brief periods anyway."

I decided to check for myself what my own primary radio listening environment is like. I believe it is typical of the average consumer's environment. Using a Radio Shack sound level meter (Cat. No. 33-2050) set to 'A' weighting and slow response, I measured the sound level in my car (A 1990 Eagle Talon TSi AWD), both with and without the radio on, while driving to work. The sound level with the radio adjusted to my normal, comfortable listening level was in the range of 80-85 dB. The noise level with the radio turned off was 74 dB. So Moulton's 12dB value seems right on the money. I found similar S+N/N results

while listening at work with 3 of the 4 computers in my office turned on. I was unable to measure the clock radio in my bedroom, as the ambient noise level is too low for the Radio Shack meter to read.

Note that given the state of the car environment, improved digital sound provides little or no benefit to the primary consumer of radio (the mobile listener), and is an inefficient use of bandwidth because, by Bonneville International Corporation's statements, "all three IBOC systems that have been proposed extend the frequency band of the broadcasting station, although within the emissions mask, far beyond existing analog bandwidth. This expanded bandwidth will most likely interfere with 2nd and 3rd adjacent stations." When the FM band was first allocated, 200KHz per channel with 1st-adjacent channels not assigned, thus allowing 50 stations per market, was the intent [Shrader, p 406]. Due mostly to economic factors in producing inexpensive radios, which contributed to the growth of the industry, 2nd and 3rd-adjacent channel restrictions were added. However, as shown by the NAB's own receiver tests, as well as those of the commission, it is possible to build receivers with sufficient 2nd and 3rd-adjacent channel restriction, and the cost of doing so does not materially affect the price of the receiver. Keeping 2nd and 3rd-adjacent channel restrictions, therefore, at least doubles the bandwidth allocated to a single FM station, and thus reduces by half the number of stations that can exist in any one market. Thus, I believe that IBOC is not the best way to deliver digital content. There are many other ways (including the Internet, use of a different frequency band for the digital signal) in which out-of-band digital content can be delivered to fixed receivers, which are more likely to be able to take advantage of the improved quality (real or perceived) because the listening environment can be more easily controlled and listeners will be able to listen more critically as well because they are not distracted by the task of keeping the car between the lines on the road.

The NAB's contention that "LPFM service areas would be too small to be useful to mobile listeners" is also bogus. As they point out in their own arguments against LPFM, the useful listening area of an FM station is greater than that implied by the 60 dBu contour. In fact, LPFM works today. A perfect example of an LP100-class station operating in a major metropolitan area is KFJC in Los Altos Hills, CA, which broadcasts with an ERP of 108 watts. When I lived in California, I would listen to KFJC while commuting between my home in Woodside and my workplace in San Jose, a driving distance of approximately 35 miles. The station came in quite well along the entire route. Another example of an LPFM station in existence today is WMBR in Cambridge, MA. It currently operates in stereo with an ERP of 720 watts, putting it in the LP1000 class, but had quite a decent coverage when I worked there in the early 1980s, when it was broadcasting in mono with an ERP of around 200 watts. Indeed, the fact that it was a meager 10 watt station broadcasting in mono and then known as WTBS did not deter a young Oedipus (Edward Hyson) from broadcasting the first punk rock show in the country over its airwaves, or from going on to become Program Director at Boston's legendary WBCN. The claims that the NAB makes that LPFM stations will not be able to produce quality programming are also shown to be bogus by these stations, KFJC in particular has won many awards, including being voted the best station in the Bay Area. It has a number of long-running unique programs, from Phil Dirt's surf show and Robert Emmett's "Norman Bates Memorial Soundtrack Show" to Dave Emory's alternative look at world

affairs and big business (which I personally find a little out there, but I consider it good entertainment). They have even broadcast live from England over ISDN lines.

[Bare] presents a good description of what it takes to get airplay on today's radio stations. You thought payola was dead? In the words of John Wayne, "not hardly." I find it hard to believe that current commercial stations can claim to be operating in the public interest (as opposed to their own profit interest) when I read passages such as the following:

> "One program director (PD) at a big L.A. station said to me flat-out, 'We don't break new artists.' Geez Louise -- how are we supposed to become established artists if major radio won't play our music?"

The basic problem, of course, is that most "major radio" stations have small playlists, and, again according to [Bare]:

> "Before a PD can place a song in rotation, some other song has to be eliminated from the playlist..."

I do not believe that LPFM stations will be inclined to model themselves after the "major radio" stations. I expect it is much more likely that they will model themselves after the likes of KFJC, and provide a diversity of programming that is not available in most of today's radio.

References:

[Bare] Jon Bare, "Getting Great Radio Airplay", Recording Magazine, May 1999

[Moulton] Dave Moulton, "Compression and Overcompression", Recording Magazine, February 1999

[Shrader] Robert L. Shrader, "Electronic Communications, Second Edition", McGraw-Hill 1967